



## Articles

# Relationship Between Childhood (Un)predictability and Life Milestones in Young Brazilians

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## Abstract

The present study sought to investigate whether perceived family unpredictability affects the development of life history strategies in both the reproductive and somatic domains by evaluating the ages at which life milestones occurred. In this study 211 young Brazilians answered a 10-item instrument that contained future milestones, the Family Unpredictability in Childhood, and a sociodemographic questionnaire. Not all participants had already achieved the milestones. Earlier ages of giving birth to the first child, marrying, starting a family, and at first formal employment were correlated with greater unpredictability scores. Significant correlations were found more frequently for the participants who had already met the milestones. Data support the importance of the childhood environment for later development. Results suggest that data obtained based on the ages at which milestones occurred and ages at which milestones are expected to occur may present important differences with regard to the influence of environmental factors.

*Keywords:* evolutionary psychology, life history theory, unpredictability, reproductive strategies

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Like other human processes, development involves the integration of phylogenetic, ontogenetic, and cultural components. The relationship between these elements distinguishes human maturation from the maturation of other species, with intra-species variations (Ellis, Figueredo, Brumbach, & Schlomer, 2009). Throughout this development, choices are made based on decision making. Some very important choices, referred to as life milestones, occur as adulthood emerges, when the body has reached sexual maturity and the individual is professionally active (Rickard, Frankenhuys, & Nettle, 2014).

The term “milestone” was used by Wilson and Daly (2006) to refer to special events in the lives of young people, such as the first sexual intercourse, first childbirth, first formal employment, and starting a family. According to the authors, the option of accomplishing or not accomplishing each milestone and the age at which each milestone occurs reflect the adjustment of strategies between individual and environmental components of decision making. According to evolutionary life history theory, such adjustments occur while facing life’s dilemmas between the reproductive and somatic domains, which are constantly present in the life history of individuals. The somatic domain is related to investments that earn reproductive potential, contributing to maintenance of the body, physical and mental development, and growth. The reproductive

domain is related to find, to attract and to hold partners, to produce offspring (e.g. sexual activity, gametes production, gestation and childbirth), and to invest in the quality of the offspring (e.g. lactation, parental care, protection, teaching, and socialization). Within the reproductive domain, there is still another dilemma: current versus future reproduction. Make choices for the current reproduction has greater reproductive value, since it produces offspring that matures sooner than the future offspring (still uncertain). Consequently, investment in an allocation domain restricts investment in another domain (Ellis et al., 2009; Geary, 2003).

Evolutionary dilemmas appear to be solved according to a species-specific pattern as human development progresses. Primarily, somatic investment increases from birth until puberty, eventually showing nepotistic investment with the presence of younger siblings. Reproductive effort begins to be more expressive once sexual maturation occurs, reaching its peak in the middle of adulthood and decreasing over time. Advancing age gives way to investments in nepotism, including alloparental care that is offered by grandparents (Geary, 2003). Furthermore, these dilemmas are adjusted by individuals throughout their development based on the stability and availability of environmental resources: environments with stable and predictable resources favor strategies focused on somatic investment and long-term outcomes. Otherwise, environments with unstable and unpredictable resources favor strategies focused on immediate reproductive domains and short-term outcomes (Ellis et al., 2009; Wilson & Daly, 1997). In this way, early investment in reproductive domains, and consequently the postponement of the investment in somatic domains, can be considered as a strategy of “fast” life cycle. Likewise, the inverse relationship between reproductive and somatic domain, can be considered as a strategy of “short” life cycle (Ellis et al., 2009).

Some previous researches showed evidence for the life history propose. Wilson and Daly (1997) analyzed demographic data from Chicago neighborhoods in the United States. They concluded that residents in low-income and more violent neighborhoods had higher risk-taking behaviors, faster life history strategies, lower life expectancy, shorter time horizons, and an advance of life history stages (e.g., getting married, having children, etc.). In another research, Wilson and Daly (2006) compared expectations between 91 young offenders and 284 high school students and hypothesized that young offenders were excessively oriented in the present because of their difficult developmental history and compressed life courses (e.g., expectations of early reproduction, early deaths of relatives, and so on). These researchers presented pairs of future milestones to the subjects and asked them to indicate which of them they expected to happen first. The groups of individuals who had not yet achieved the milestone were significantly different. The offenders expected to marry earlier and have children sooner and saw themselves as less likely to graduate from high school compared with the other group. Although the offenders were more likely to have reached the milestone of first sexual intercourse, the participants in the two groups were very similar for the other milestones.

Empirical neuroimaging evidence for the life history proposes is growing. Gonzalez, Allen, and Coan (2016) made a longitudinal study with functional magnetic resonance imaging of 83 participants. The parents of the participants answered scales about the neighborhood quality and parental practices when they were 13 years old. After 12 years, participants completed a monetary incentive delay task. The authors concluded that findings suggest that neighborhood ecology in adolescence is associated with greater neural reward sensitivity in adulthood above the influence of parental practices or current income.

It should be emphasized that the researches presented above did not work specifically with the construct of the environment unpredictability. Nevertheless, the construct is directly related with the data showed such as

quality of the place of residence and income. Unpredictability does not refer to a lack of resources but rather the variability of availability (Ellis et al., 2009; Ross & Hill, 2002). However, according to Rickard, Frankenhuis, and Nettle (2014), financial deprivation exposes the individual to a harsh environment that results in perceiving the future in the short term. Ramirez-Valles, Zimmerman, and Newcomb (1998) stated that financial deprivation is commonly accompanied by indications of unpredictable care/support, such as weak supervision by caregivers, which results in unpredictable discipline (e.g., maintenance and application of agreed rules) and difficulty maintaining routines.

With regard to the perception of the (un)predictability of the environment, Ross and Hill (2002) proposed a model in which an individual's perception of unpredictability is formed during childhood and develops during maturation. This model of the perception of unpredictability consists of an individual understanding of the availability of resources in the environment during development and especially in childhood, and it is a precursor of the expectations of the individual regarding what is available in the long and short term (Rickard, Frankenhuis, & Nettle, 2014).

Other studies have documented the relationship between unpredictability environment, and the acceleration of life history stages, especially with regard to the reproductive domain. The Oregon Social Learning Center (Kerr, Leve, & Chamberlain, 2009; Leve & Chamberlain, 2004; Leve, Van Ryzin, & Chamberlain, 2015) works with female juvenile offenders and has found a relationship between high unpredictability and earlier ages of sexual behavior investment (i.e., fast life history strategies). Researchers are working with a group of 13-to 17-year-old girls in the Multidimensional Treatment Foster Care (MTFC) program for delinquent girls, a family-based alternative to residential, institutional, and group care for children and adolescents who have behavioral, emotional, and mental health problems. Data have shown a high frequency of risky sexual behavior and teenage pregnancy, accompanied by high environmental unpredictability in childhood, including changes in caregiver structure (e.g., the lack of a parent, new parental relationships, and housing with relatives or other adults) that require constant changes in rules and routines. Such unpredictability is associated with an increase in exposure to childhood sexual abuse and parental neglect. On the other hand, Kerr, Leve, and Chamberlain (2009) evaluated a sample of 166 girls who were enrolled in the MTFC program and found a delay in reproduction activity. The MTFC program involves individual placement in foster homes with parents who are highly trained, supervised, and certified by the state to create maximally structured and predictable environments for girls.

The present study sought to investigate whether perceived family unpredictability affects the development of life history strategies in both the reproductive and somatic domains by evaluating the ages at which life milestones occurred. Importantly, unlike other studies that dealt with life milestones, the participants in our sample did not necessarily already achieve the milestones. We expected that individuals who had higher perceptions of family unpredictability during life would present a shorter timeframe of achieving the milestones and short-term expectations of the occurrence of each milestone (short life cycle strategy) (Belsky, Schlomer, & Ellis, 2012; Ellis et al., 2009; Gonzalez, Allen, & Coan, 2016; Wilson & Daly, 2006). This hypothesis regarding the relationship between the occurrence and expected occurrence of milestones was based on Ross and Hill (2002), who proposed a model in which the individual perception of unpredictability has more of an influence on human behavior than actual resources that are available.

Researches showed above explored items related to current reproduction (e.g. first sexual intercourse, first childbirth, start a family, marry), presenting the relationship between unpredictability and early ages in life milestones to reproductive domain. We also expected a relationship between predictability and early ages in life milestones to somatic domain items that depend on long-term resources such as buy own house, leave parents' house/live alone, buy own car, go to college, and graduate from college. Furthermore, we used one somatic item, first formal employment, which is necessary to maintain the individual subsistence; because of its singularity, we expected the inverse result. In Brazil, family socioeconomic status is directly related to beginning work at an earlier age. According to Romanelli (1997), in Brazilian lower-class families, children begin labor assignments at 6 or 7 years of age. This includes both performing housework and being included in an informal labor market. As family financial conditions improve, years of education increase, and entry into the labor market is postponed.

## Methods

This paper is part of a large research Project that analyzes the human behavior from a evolutionary approach. This study has a descriptive design that adopts quantitative procedures.

### Participants

Two hundred eleven young individuals participated in the study (120 men and 91 women; mean age = 21.54 years,  $SD = 2.105$  years). They were residents of two socioeconomically different cities in southeastern Brazil. Participants were reached through the email network of two universities, where they were attending or had attended. A total of 68.2% (144) of the participants declared themselves as white, 21.8% (46) were parda or "mulatto", 2.8% (6) were black, and 7.1% (15) were "other." Socioeconomic status was measured according to Brazil Economic Classification Criteria (*Critério de Classificação Econômica Brasil - CCEB*): 36.5% (77) were class A, 48.3% (102) were class B, and 15.2% (32) were class C.

### Measures

#### Structured Sociodemographic Questionnaire

We used a structured questionnaire that evaluated the following: age (How old are you?), working status (Do you work?), marital status (Are you married?), religion (Do you have a religion?), number of children (How many children do you have?), housing condition (In which neighborhood do you live? How many times have you moved?), and purchasing power index based on CCEB criteria. Although the CCEB index was originally utilized to categorize economic classes, we used it as a continuous measure that provided scores from 0 to 46. Higher scores represented higher consumption.

#### Family Unpredictability in Childhood Scale (Escala de Imprevisibilidade Familiar na Infância [EIFI])

The EIFI included 27 items that were validated for the Brazilian population by the authors (Howat-Rodrigues, De Andrade, & Tokumar, 2012). The items are answered on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) with three multidimensional factors: (un)predictability of care/support (e.g., I knew my family would take care of me; Cronbach's alpha = 0.88), meals (e.g., In my home, from Monday to Friday, dinner time

would be the same; Cronbach's  $\alpha = 0.85$ ), and financial resources (e.g., There were moments in my house when we had little money to live; Cronbach's  $\alpha = 0.80$ ).

### Future Milestones

We used a 10-item instrument that contained the following future milestones as defined by [Wilson and Daly \(2006\)](#): buy own house, first sexual intercourse, first childbirth, first formal employment, leave parents' house/live alone, start a family, marry, buy own car, go to college, and graduate from college. For each item, the participants answered whether the event had already occurred (Yes/No). If they answered Yes, then they were asked how old they were at that point. If they answered No, then they were asked how old they imagined they would be when the event would occur. If they intended not to conclude the event, then they were asked to answer Never. Most of our sample was composed of young individuals who had not accomplished the listed milestones.

### Procedures for Data Collection

The research was approved by the *Comitê de Ética em Pesquisa* (Ethics Committee in Research – CEP) of the Health Sciences Center of the Federal University of Espírito Santo (approval no. 198/11). The participants were informed about the research by the main researcher. Those who agreed to participate signed an informed consent form. Participants were recruited through e-mails that were sent to student groups by the staff of the universities where the study was conducted. We selected men and women who were between 18 and 25 years of age and presented socioeconomic differences. After first contact, the researchers explained the aims of the study and scheduled an interview. Data collection was performed individually, and the interviews lasted an average of 30 minutes.

## Results

The data were tabulated and statistically analyzed using SPSS 16 software. Descriptive statistics were employed to investigate the distribution of sociodemographic variables. Pearson correlation analysis was employed to verify relationships between perceived family unpredictability and the age at which milestones occurred. Each age of milestones was correlated to participants who had already accomplished those milestones (yes category in [Table 1](#)), and to participants who had not achieved the milestone (no category in [Table 1](#)). Answers from participants who reported that would never accomplish a specific milestone were excluded from the analysis of that milestone. In the final model, variables were considered statistically significant at  $p < 0.05$ .

### Sample Features

A total of 94.8% of the participants ( $n = 200$ ) did not own a home, 86.3% ( $n = 182$ ) had no car, 2.4% ( $n = 5$ ) were married, 53.6% ( $n = 113$ ) had a boyfriend/girlfriend, and 37.9% ( $n = 80$ ) no longer lived with their parents. Only one participant had a child, but 82.5% ( $n = 174$ ) already had their first sexual intercourse. A total of 97.2% ( $n = 205$ ) had attended or were attending college, and 33.6% ( $n = 71$ ) had already been or were in formal jobs.

## Pearson Correlations

### Milestones × Unpredictability

Table 1

*Descriptive Statistics (n, M, and SD) and Correlations Between Milestones and Family Unpredictability Factors (r) for Participants Who Answered Yes or No for Each Milestone*

Life Milestone	n	M	SD	r		
				Care/support	Financial resources	Meals
<b>Buy own house (S)</b>						
Yes	11	19.45	5.61	0.31	0.59	-0.10
No	199	29.50	3.63	0.03	0.05	-0.04
<b>First sexual intercourse (R)</b>						
Yes	174	17.49	1.78	-0.18*	-0.10	-0.16*
No	36	21.94	3.21	-0.14	0.00	0.05
<b>First childbirth (R)</b>						
Yes	1					
No	200	31.02	3.24	0.07	0.07	-0.08
<b>First formal employment (S)</b>						
Yes	71	19.89	2.38	-0.28*	-0.34**	-0.27*
No	139	23.81	2.45	-0.09	-0.08	-0.09
<b>Leave parents' house/live alone (S)</b>						
Yes	80	18.34	2.37	-0.13	0.07	-0.05
No	129	25.26	2.75	-0.16	-0.05	-0.06
<b>Start a family (R)</b>						
Yes	5	23.00	5.96	0.96*	-0.27	-0.47
No	198	28.90	3.30	0.04	0.04	-0.01
<b>Marry (R)</b>						
Yes	5	22.00	6.17	0.98**	-0.37	-0.39
No	189	28.53	2.95	0.02	0.09	-0.03
<b>Buy own car (S)</b>						
Yes	29	25.30	2.68	0.15	-0.05	0.20
No	176	20.00	1.97	0.05	0.07	-0.05
<b>Go to college (S)</b>						
Yes	205	18.22	1.25	0.01	0.19**	0.10
No	5	20.00	1.87	0	0.66	-0.78
<b>Graduate from college (S)</b>						
Yes	40	22.40	1.34	0.09	0.01	0.32*
No	170	23.71	1.74	-0.03	0.16*	0.05

*Note.* The total number of participants was 211, but the *N* column may present less than 211 participants because participants who answered "Never" were excluded from the analysis of that milestone. *M* and *SD* measure age. S = Somatic Domain; R = Reproductive Domain.

\* $p < .05$ . \*\* $p < .001$ .

Correlations between the age at which the milestones occurred and childhood unpredictability factors (care/support, financial resources, and meals) were significant for participants who had already accomplished those



milestones. For participants who had not achieved the milestones, only the age at which they graduated from college was correlated with unpredictable financial resources (Table 1).

Family unpredictability factors were negatively correlated with the age at which the milestones occurred. Age at first sexual intercourse was correlated with care/support and meals, and age at first formal employment was correlated with care/support, meals, and financial resources. Other factors were positively correlated with the age at which the milestones occurred. The age at which the participants went to college was correlated with financial resources. Age at college graduation was correlated with meals. The ages at which the participants married and started a family were both correlated with support/care, although only five participants had achieved these milestones (Table 1).

## Discussion

Our initial hypothesis was that unpredictability would be negatively correlated with the ages at which the reproductive milestones occurred, and the ages of a specific somatic item (first formal employment), including participants who had previously achieved the milestones and participants who had not yet achieved the milestones but reported a date when they would meet them (Belsky, Schlomer, & Ellis, 2012; Ellis et al., 2009; Gonzalez, Allen, & Coan, 2016; Wilson & Daly, 2006). Our hypothesis was confirmed for four of the 10 milestones. For participants who had already achieved the milestone, age at first sexual intercourse was negatively correlated with care/support and meals, and age at first formal employment was negatively correlated with care/support, meals, and financial resources. Although only five participants had married and started a family, the unpredictability of support/care was significantly correlated with both of these milestones. This kind of behavior can be considered as a strategy of “short” life cycle (Ellis et al., 2009).

Consistent with previous studies (Kerr, Leve, & Chamberlain, 2009; Leve & Chamberlain, 2004; Leve, Van Ryzin, & Chamberlain, 2015; Wilson & Daly, 1997), the reproductive domain (i.e., age at first intercourse, marrying, and starting a family) presented a clear relationship with some unpredictability factors, especially care/support. Higher unpredictable care/support scores were associated with a younger age of having a first child, marrying, and starting a family, indicating fast life history strategies. Neglect, little support, and low parental monitoring provide cues to the child about levels of environmental stress. These environmental cues cause the individual to adjust life history strategies accordingly and adopt fast life cycle traits, such as early puberty, early onset of sexual activity, teenage pregnancy, and lower life expectancy (Belsky, Schlomer, & Ellis, 2012; Ellis et al., 2009).

Age at first formal employment also presented the expected relationship with unpredictability (Romanelli, 1997). Our data showed that higher perceived unpredictability for all unpredictability factors was correlated to a lower age at first formal employment. In Brazilian lower-class families, children begin labor in early ages. Otherwise, as Brazilian higher-class families present an increase in years of education, entry into the labor market is postponed (Romanelli, 1997). This result supports the positive correlation between age at going to college and financial resources. When considering that investment in the labor market limits investment in education, and *vice versa*, this positive relationship makes sense.

Wilson and Daly (2006) previous data showed important differences between groups of individuals who had achieved the milestone and those who had not yet achieved the milestone. They compared high school

students and young offenders. Differently, in the present study, significant correlations were found more frequently for the participants who had already met the milestones. For the participants who had not yet achieved the milestones, only age at college graduation was significantly correlated with unpredictable financial resources. However, although the participants had not yet graduated from college, most of them were in college at the time of the study and could predict their age at graduation with good accuracy. We can assume that being our most homogeneous sample in terms of unpredictability, these differences may not have appeared. Environmental unpredictability is closely related to shorter time horizons (Wilson & Daly, 2006) and a decreased life expectancy (Wilson & Daly, 1997). However, when dealing with plans for the future, the estimate of when a plan will be carried out does not appear to be based on homogeneous environmental cues.

## Conclusion

It is important to address some limitations of this study. We analyzed the perception of unpredictability reported by the participant. We cannot rule out possible retrospective biases such as creating false memories, influence of current environment, and individual perception in a single-time. Another limitation of the study concerns the sample profile, in which the participants were concentrated in socioeconomic classes A and B and most were college students. These features may hinder the understanding of unpredictability, as people in lower socioeconomic classes often do not have access to college, and often experience more unpredictability (Howat-Rodrigues & Tokumaru, 2014). Unpredictability is not necessarily synonymous with poverty (Ellis et al., 2009), but poverty is commonly seen in unpredictable contexts (Romanelli, 1997).

Despite its limitations, the present study may open discussions of data that were obtained based on the ages at which milestones occurred and ages at which milestones are expected to occur, which were previously treated as equivalent in preliminary studies (Wilson & Daly, 2006). The present results suggest that these two variables may present important differences with regard to the influence of environmental factors. The present data also support the importance of the childhood environment for later development and are consistent with Ellis et al. (2009), who analyzed types of human investment throughout life and changes in life history strategies that occur as a function of environmental cues. The present results confirm the hypothesis that the perception of an unpredictable environment impacts investment strategies, thus supporting the model of Ross and Hill (2002).

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## Competing Interests

The authors have declared that no competing interests exist.

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